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TITLE: Video coder providing implicit coefficient prediction and scan adaptation for image coding and intra coding of video

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[0028] The block associated with the highest gradient from block B is used as a basis of prediction. If the vertical gradient is greater than the horizontal gradient, it is expected that block A will have high correlation with block X, so the DC coefficient predictor 300 employs horizontal prediction in which it uses block A as a basis for prediction of block X. If the horizontal gradient is greater than the vertical gradient, so the DC coefficient predictor 300 employs vertical prediction in which it uses block C as a basis for prediction of block X. The DC coefficient predictor 300 outputs the DC coefficient of the block used for prediction (DC.sub.A or DC.sub.C) to a subtractor 310. The DC coefficient predictor 300 also generates a hor/vert signal 320 indicating whether horizontal prediction or vertical prediction is performed.

[0039] An inverse prediction operation is performed in the reconstruction circuit 250, shown in FIG. 4. For every block X, a DC coefficient predictor 400 maintains in memory data of an adjacent block A prior to block X, data of an adjacent block C above block X and data of a block B prior to block C, the block above block X. The DC coefficient predictor 400 compares a DC coefficient of block A with a DC coefficient of block B to determine the vertical gradient. Further, the DC coefficient predictor 400 compares a DC

coefficient of block C with the DC coefficient of block B to determine the horizontal gradient. If the horizontal gradient is greater than the vertical gradient, the DC coefficient predictor 400 generates the DC coefficient of block C as a basis for prediction. Otherwise, the DC coefficient predictor 400 generates the DC coefficient of block A. The DC coefficient predictor 400 also generates a hor/vert signal 420 identifying whether horizontal or vertical prediction is used.

6. The method of claim 5, wherein the prediction step further comprises steps of: when the vertical gradient is greater than the horizontal gradient, predicting a DC coefficient of the block of new image data based on DC coefficient of the first block, and when the horizontal gradient is greater than the vertical gradient, predicting a DC coefficient of the block of new image data based on DC coefficient of the third block and the generating step comprises a step of generating a DC residual signal based on the predicted DC coefficient and the actual DC coefficient of the block of new image data.

22. The encoder of claim 21, wherein the DC coefficient predictor employs vertical prediction based on the DC coefficient of the first block when the horizontal gradient is greater than the vertical gradient, and the DC coefficient predictor employs horizontal prediction based on the DC coefficient of the third block when the vertical gradient is greater than the horizontal gradient.

27. The encoder of claim 26, wherein the DC coefficient predictor employs vertical prediction based on the DC coefficient of the

first block when the
horizontal gradient is greater than the vertical gradient,
and the DC
coefficient predictor employs horizontal prediction based
on the DC coefficient
of the third block when the vertical gradient is greater
than the horizontal
gradient.